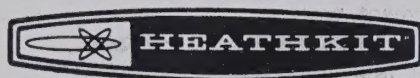


H7h 46K1 No88 IM-5210



# ***instructions***

FOR THE



## **40 KV PROBE METER MODEL IM-5210**



### **INTRODUCTION**

The Heathkit Model IM-5210 40 kV Probe Meter is a convenient, self-contained probe that measures extremely high DC voltages up to 40,000 volts.

The on-off switch mounted on the handle protects the meter during transportation and hookup.

Refer to the "Kit Builders Guide" for complete information on unpacking, parts identification, tools, wiring, soldering, and step-by-step assembly procedures.





## PARTS LIST

Check each part against the following list.

To order a replacement part: Use the Parts Order Form furnished with this kit. If one is not available, see "Replacement Parts" in the "Kit Builders Guide."

QTY.	DESCRIPTION	PART No.	CIRCUIT Component No.	PRICE Each
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CAUTION: Do not unpack or handle the 800 MΩ resistor until you are instructed to do so in a step. Moisture from your fingers can change its resistance, and thus affect its accuracy.

1	800 MΩ, 1/2-watt, 2% resistor	2-331	R1	5.25
1	Slide switch	60-14	SW1	1.30
1	Rubber insulator	73-21		.15
1	Handle top	95-606		3.05
1	Handle bottom			
1	Handle tip			
2	6-32 x 5/16" flat head screw	250-274		.05
2	#6 x 5/8" self-tapping screw	250-559		.05
2	#2 x 1/4" self-tapping screw	250-582		.05
2	#6 lockwasher	254-1		.05
2	Spade lug	259-32		.15
1	Alligator clip	260-1		.10
1	Large black wire	341-1		.10/ft
1	Small black wire	344-90		.05/ft
1	Red wire	344-92		.05/ft
1	Meter	407-196	M1	14.85
1	Hex stud	455-637		.75
1	Probe tip	477-12		.35
1	Switch label	390-1194		.25
1	Heathkit nameplate	390-1108		.15
1	Nut starter	490-5		.15
1	Blue and white label	391-34		.15
1	Parts Order Form	597-260		
1	Kit Builders Guide	597-308		
1	Instructions (See first page for part number.)			
	Solder (Additional 3' rolls of solder, #331-6, can be ordered for 25 cents each.)			

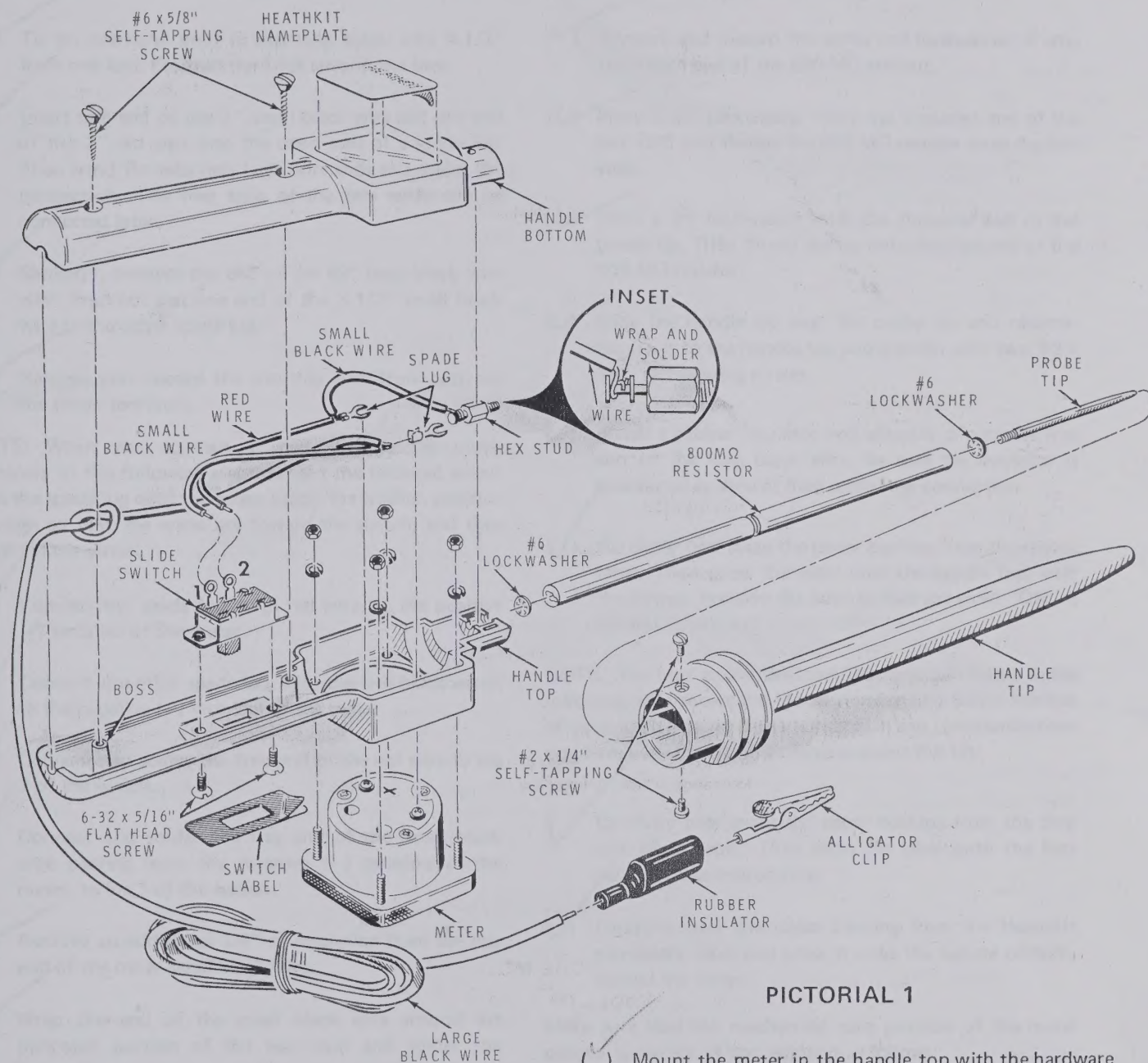
The above prices apply only on purchases from the Heath Company where shipment is to a U.S.A. destination. Add 10% (minimum 25 cents) to the price when ordering from a Heathkit Electronic Center to cover local sales tax, postage,

and handling. Outside the U.S.A., parts and service are available from your local Heathkit source and will reflect additional transportation, taxes, duties, and rates of exchange.





## STEP-BY-STEP ASSEMBLY



PICTORIAL 1

Refer to Pictorial 1 for the following steps.

- ( ) Mount the slide switch in the handle top with two 6-32 x 5/16" screws. Position the switch as shown.

NOTE: The Heath Company has provided a plastic nut starter with this kit. Use the nut starter to hold and start the nuts in the next step.

- ( ) Mount the meter in the handle top with the hardware supplied with the meter. Position the meter so that the meter scale is away from the switch. CAUTION: Do not overtighten the meter hardware. This can damage the meter case.

NOTE: As you prepare lengths of wire, as in the following step, first cut the wire to the indicated length and remove 1/4" of insulation from each end. Then twist together the small strands of wire at each wire end and melt a small amount of solder on these bare wire ends.





- (✓) Prepare the following lengths of wire:

3" small black	3-1/2" small black
3" red	48" large black

- (✓) Tie an overhand knot in the long black wire 4-1/2" from one end. Position the knot around the boss.
- (✓) Insert one end of the 3" small black wire and one end of the 3" red wire into the open tabs of a spade lug. Then bend the tabs over both wire ends and solder the connection. The free ends of the two wires will be connected later.
- (✓) Similarly, connect the end of the 48" large black wire with the knot and one end of the 3-1/2" small black wire to the other spade lug.
- (✓) Remove and discard the shorting wire from between the meter terminals.

NOTE: When you connect a spade lug to the meter terminals in the following steps, loosen the terminal screw, slide the spade lug onto the screw under the washer, position the lugs so that the wires are toward the switch, and then retighten the screw.

- (✓) Connect the spade lug, with red wire, to the positive (+) terminal of the meter.
- (✓) Connect the other spade lug, with the two black wires, to the negative (-) terminal of the meter.
- (✓) Connect and solder the free end of the red wire to lug 2 of the switch.
- (✓) Connect and solder the free end of the small black wire coming from the negative (-) terminal of the meter, to lug 1 of the switch.
- (✓) Remove an additional 1/4" of insulation from the free end of the other small black wire.
- (✓) Wrap the end of the small black wire around the indicated portion of the hex stud and solder the connection.
- (✓) Let the solder connection cool. Then place the hex-shaped portion of the hex stud into the end of the handle top as shown.
- (✓) Mount the handle bottom with two #6 x 5/8" self-tapping screws. Be sure the long black wire extends from the hole in the end of the handle.

NOTE: In the next step, do not handle the resistor with your bare hands. Finger prints can change the resistance enough to cause inaccurate readings. Use a soft dry cloth between your hands and the resistor.

- (✓) Remove and discard the screw and lockwasher, if any, from each end of the 800 MΩ resistor.
- (✓) Place a #6 lockwasher onto the threaded end of the hex stud and thread the 800 MΩ resistor onto the hex stud.
- (✓) Place a #6 lockwasher onto the threaded end of the probe tip. Then thread the tip onto the free end of the 800 MΩ resistor.
- (✓) Slide the handle tip over the probe tip and resistor. Secure it to the handle top and bottom with two #2 x 1/4" self-tapping screws.
- (✓) Install a rubber insulator and alligator clip on the free end of the long black wire. Be sure the insulator is positioned as shown; then solder the connection.
- (✓) Carefully peel away the paper backing from the switch label. Then press the label onto the handle top, over the switch. Position the label so that the word "ON" is toward the meter.

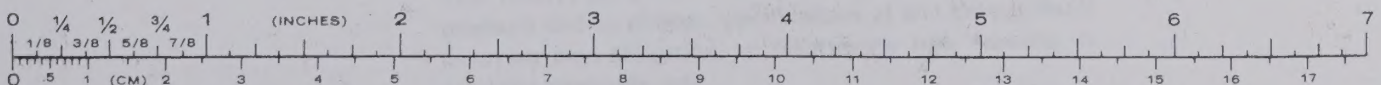
NOTE: The blue and white label that you will install in the following step shows the Model number and Series number of your kit. Refer to these numbers in any communications you have with the Heath Company about this kit.

- (✓) Carefully peel away the paper backing from the blue and white label. Then press the label onto the first page of these instructions.
- (✓) Carefully peel the paper backing from the Heathkit nameplate label and press it onto the handle bottom, behind the meter.

Make sure that the mechanical zero position of the meter pointer is correct. If not, adjust it as follows:

- ( ) Place the instrument in the normal operating position. Turn the plastic screw on the meter face with a screwdriver while gently tapping the meter face with one finger until the pointer lines up with the zero line on the left side of the scale.

This completes the assembly of your 40 kV Probe Meter.







## OPERATION

**WARNING: HIGH VOLTAGES ARE EXTREMELY DANGEROUS. NEVER MEASURE DC VOLTAGES IN EXCESS OF 40,000 VOLTS.**

This probe is designed to permit high voltage measurements to be made as safely as possible. However, **ALWAYS MAKE SURE THAT THE GROUND CLIP IS CONNECTED TO THE CHASSIS OF THE UNIT UNDER TEST AND THAT THE SWITCH ON THE PROBE IS IN THE OFF POSITION WHEN YOU ARE NOT MAKING AN ACTUAL MEASUREMENT.** While the conductors inside the handle

and ground lead never have more than about a tenth of a volt across them when properly connected, these parts will be exposed to the full voltage under test if the ground lead is not connected to the chassis.

Whenever possible, contact the high voltage terminal under test with the power turned off. Then turn the power on, slide the probe switch to the on position, take the reading, slide the probe switch to the off position, turn the power off, and remove the probe from the circuit under test.

Be sure the slide switch is in the OFF position when the Probe is not in use.

## IN CASE OF DIFFICULTY

Most kits returned for repair, do not function properly due to poor solder connections. Therefore, many troubles can be eliminated if you carefully inspect all the connections to make sure they are soldered as described in the "Soldering" section of the "Kit Builders Guide." Reheat any doubtful connections and be sure all the wires are soldered at places where several wires are connected. Recheck the wiring. Trace each lead in colored pencil on the Pictorial as it is

checked. It is frequently helpful to have a friend check your work. Someone who is not familiar with the kit may notice something you have consistently overlooked.

**NOTE:** In an extreme case where you are unable to resolve a difficulty, refer to the "Customer Service" information in the "Kit Builders Guide."

## SPECIFICATIONS

Voltage Range . . . . .	0 — 40 kVDC.
Accuracy . . . . .	±3% of full scale.
Size . . . . .	15" long x 1-7/8" wide x 1-1/2" high.
Weight . . . . .	8 oz.

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The Heath Company reserves the right to discontinue products and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.





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